

3 A synchronous 900 kHz step-down DC-DC converter with inhibit function based on the ST1S10 (DFN)

Data brief

Features

- Input voltage range: 2.5 V to 18.0 V
- Max I_{OUT} : 3 A
- High internal switching frequency: 900 kHz
- PWM mode operation with a fixed frequency or synchronized to an external frequency between 400 kHz and 1.2 MHz
- Inhibit pin available
- Quiescent current: < 6 μ A in inhibit state
- RoHS compliant

Description

The STEVAL-ISA044V6 demonstration board is based on the ST1S10 device assembled in a DFN package. The ST1S10 is a step-down DC-DC converter with the inhibit function optimized for powering high voltages in LCD applications and low voltages in digital-core HDD applications. It replaces the high-current linear solution when high power dissipation is an issue.

It provides up to 3 A over an input voltage range of 2.5 V to 18.0 V, and synchronous rectification removes the need for an external Schottky diode. A high internal switching frequency (900 kHz) allows for the use of tiny surface-mount components, as well as a resistor divider to set the output voltage value. Only an inductor and 3 capacitors are required.

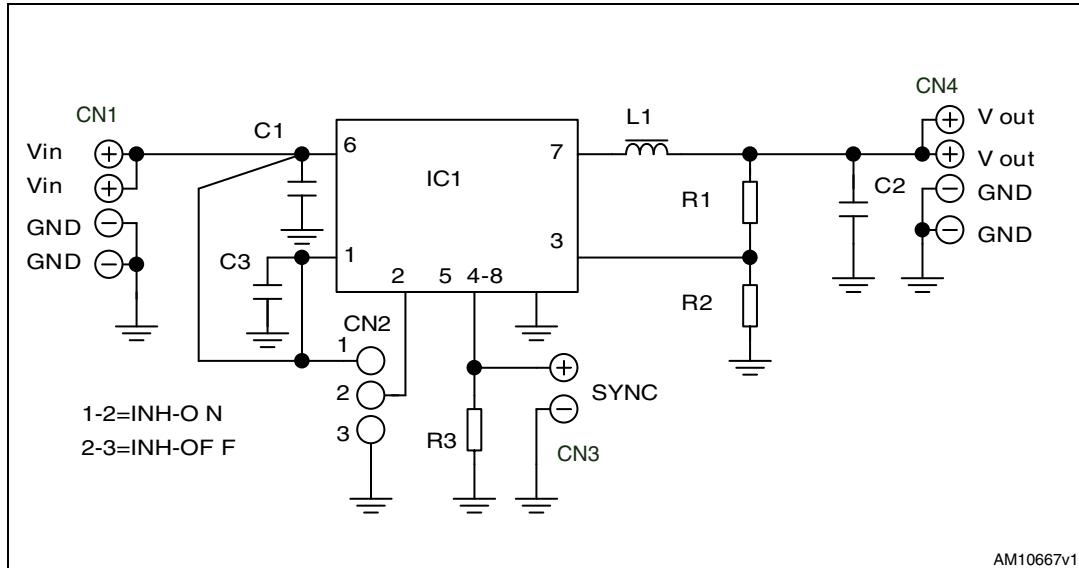
The current-mode PWM architecture and stable operation with low-ESR SMD ceramic capacitors result in low output ripple. To maximize power conversion efficiency in light load, the regulator can work in burst mode automatically. The device can operate in PWM mode with a fixed frequency or synchronized to an external frequency. It switches at a frequency of 900 kHz when the SYNC pin is connected to ground or a fixed voltage (less than 5.5 V), and can synchronize the switching frequency between 400 kHz to 1.2 MHz from an external clock applied to the SYNC pin.



A thermal shutdown circuit is integrated and activates at 150 °C. Cycle-by-cycle current limitation provides protection against shorted outputs. The quiescent current is less than 6 μ A in the inhibit state.

1 Schematic

Figure 1. Schematic



2 Revision history

Table 1. Document revision history

Date	Revision	Changes
25-Oct-2011	1	Initial release.

Please Read Carefully:

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS EXPRESSLY APPROVED IN WRITING BY TWO AUTHORIZED ST REPRESENTATIVES, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER'S OWN RISK.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

© 2011 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Philippines - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com